CLAIMS

1. A rotation detection device comprising:

a rotation detecting means that detects rotary motion of a rotating body;

a rotation angle converter that outputs an rotation angle of the rotating body based on an output of the rotation detecting means;

an angular velocity converter that outputs an angular velocity of the rotating body based on the output of the rotation detecting means;

a rotation calculating means including: a rotation angle linear function calculator that calculates a linear function concerning an output of the rotation angle converter and has a phase adjustor for setting an adjustable constant term of the linear function; a trigonometric function calculator that calculates a sine or a cosine of an output value of the rotation angle linear function calculator; an amplitude adjustor that multiplies an output value of the trigonometric function calculator by a predetermined gain; and a multiplier that multiplies an output of the amplitude adjustor by the output of the angular velocity converter; and

an automatic phase adjusting means including: a phase shifting means that differentiates or integrates, with respect to time, an output of the angular velocity converter; a shifted phase sampling means that samples an output value of the phase shifting means at predetermined intervals associated with the output value of the rotation angle linear function calculator; a periodic phase deviation integrating means that adds an output of the shifted phase sampling means to a summation of outputs, having been obtained in one cycle before a predetermined point of time, of the shifted phase sampling means at the predetermined intervals associated with the output value of the rotation angle linear function calculator; and a phase gain multiplying means that multiplies a calculation result of the periodic phase deviation integrating means by a

predetermined gain, wherein the periodic phase deviation integrating means is configured to output an output of the phase gain multiplying means as a phase adjusting value for the phase adjustor.

2. The rotation detection device according to claim 1, wherein the amplitude adjustor includes an automatic amplitude adjusting means which includes:

a vibration sampling means that samples the output value of the angular velocity converter at predetermined intervals associated with the output value of the rotation angle linear function calculator;

a vibration sample value average calculating means that outputs, at predetermined intervals associated with the output value of the rotation angle linear function calculator, an average of the output values of the vibration sampling means obtained at a present time and obtained at a time one cycle earlier from the present time;

a vibration integrating means that integrates the output of the angular velocity converter with respect to time to output an integration result;

a vibration time average calculating means that calculates, at predetermined intervals associated with the output value of the rotation angle linear function calculator, a time average of the output values of the vibration integrating means;

an amplitude deviation comparator that calculates, at predetermined intervals associated with the output value of the rotation angle linear function calculator, a difference between outputs of the vibration sample value average calculating means and the vibration time average calculating means;

a periodic amplitude deviation integrating means that adds, at predetermined intervals associated with the output value of the rotation angle linear function calculator, an output value of the amplitude deviation comparator to a summation of outputs, having been obtained in one cycle before a

predetermined point of time, of the amplitude deviation comparator; and

an amplitude gain multiplying means that multiplies a calculation result of the periodic amplitude deviation integrating means by a predetermined gain;

wherein the automatic amplitude adjusting means is configured to output an output value of the amplitude gain multiplying means as an amplitude adjusting gain for the amplitude adjustor.

3. The rotation detection device according to claim 1, wherein the periodic phase deviation integrating means comprises an integrator that integrates the output value of the shifted phase sampling means with respect to time.

4. The rotation detection device according to claim 2, wherein the periodic amplitude deviation integrating means comprises an integrator that integrates the output value of the amplitude deviation comparator.

5. The rotation detection device according to claim 1, wherein the rotation detecting means includes a resolver.

6. The rotation detection device according to claim 1, wherein the rotation detecting means includes a power generator.

7. The rotation detection device according to claim 1, wherein the rotation detecting means includes an encoder.

8. The rotation detection device according to claim 1, wherein the rotation detecting means is separated from the rotation calculating means.

9. The rotation detection device according to claim 1, wherein the rotation detecting means includes the rotation

calculating means.

10. The rotation detection device according to claim 1, wherein the output of the rotation calculating means is an angular velocity output including a reduced ripple component of the angular velocity.

11. The rotation detection device according to claim 1, wherein the output of the rotation calculating means is an angular velocity output ω_{out} that is calculated from the following Expression

$$\omega_{out} = \omega(1 - G\sin(n\theta + \psi))$$

where θ is the rotation angle, ω is the angular velocity, G is the amplitude adjusting gain of the amplitude adjustor, ψ is the phase adjusting value of the phase adjustor, and n is a ripple periodic number contained in the rotation angle converter output per rotation of the rotating body.

12. The rotation detection device according to claim 1, wherein the output of the rotation calculating means is a rotation angle output including a reduced ripple component of the rotation angle.

13. The rotation detection device according to claim 1, wherein the rotation angle converter includes an integrator that integrates the output of the angular velocity converter.

14. The rotation detection device according to claim 1, wherein the rotation calculating means includes an integrator that integrates the angular velocity output ω_{out}.

15. The rotation detection device according to claim 1, wherein the output of the rotation calculating means is a rotation angle output including a reduced ripple component of the rotation angle, or an angular velocity output including a reduced ripple component of the angular velocity.

16. The rotation detection device according to claim 1, wherein said device includes a plural number of the rotation calculating means.

17. The rotation detection device according to claim 1, wherein the automatic phase adjusting means includes a phase adjusting value storing means that stores the output value of the automatic phase adjusting means in accordance with an external signal, and that updates or reads out a value stored therein.

18. The rotation detection device according to claim 1, wherein the automatic amplitude adjusting means includes an amplitude adjusting value storing means that stores the output value of the automatic amplitude adjusting means in accordance with an external signal, and that updates or reads out the stored value.